

1 1. A multiband MIMO-based dual-mode portable station
2 of 3G W-CDMA and UWB communication receiver comprising:
3 a MIMO-based dual-mode 3G W-CDMA and UWB
4 filtering and multicarrier RF section;
5 a 3G W-CDMA baseband processor;
6 an UWB OFDM multiband baseband processor;
7 a 3G W-CDMA and UWB OFDM multiband control
8 processor; and
9 a multiple antenna unit.

10 2. The multiband MIMO-based dual-mode portable
11 station of 3G W-CDMA and UWB communication receiver of
12 claim 1 wherein said MIMO-based dual-mode 3G W-CDMA and UWB
13 filtering and multicarrier RF section includes two-LNA,
14 two-AGC, two analog bandpass filters, two dual-switch, a 3G
15 W-CDMA down converter and demodulation, an UWB multiband
16 down converter and demodulation, and a A/D unit.

17 3. The multiband MIMO-based dual-mode portable
18 station of 3G W-CDMA and UWB communication receiver of
19 claim 2 wherein said two dual-switch are to provide
20 information from the two analog bandpass filters either to
21 the 3G W-CDMA down converter and demodulation or to the UWB
22 multiband down converter and demodulation.

23 4. The multiband MIMO-based dual-mode portable
24 station of 3G W-CDMA and UWB communication receiver of
25 claim 3 wherein said two dual-switch may be controlled with
26 only one of the two dual-switch connecting.

27 5. The multiband MIMO-based dual-mode portable
28 station of 3G W-CDMA and UWB communication receiver of
29 claim 2 wherein said 3G W-CDMA down converter and
30 demodulation includes a 3G W-CDMA sum over a block
31 duration, two multicarriers, and two channel select
32 filters.

33 6. The multiband MIMO-based dual-mode portable
34 station of 3G W-CDMA and UWB communication receiver of
35 claim 5 wherein said 3G W-CDMA down converter and
36 demodulation is a QPSK demodulation.

37 7. The multiband MIMO-based dual-mode portable
38 station of 3G W-CDMA and UWB communication receiver of
39 claim 2 wherein said UWB multiband down converter and
40 demodulation includes an UWB sum over a block duration and
41 four multiband down converters and demodulations.

42 8. The multiband MIMO-based dual-mode portable
43 station of 3G W-CDMA and UWB communication receiver of

44 claim 7 wherein said four multiband down converters and
45 demodulations are equal.

46 9. The multiband MIMO-based dual-mode portable
47 station of 3G W-CDMA and UWB communication receiver of
48 claim 2 wherein said A/D unit has two switches and eight
49 A/D converters.

50 10. The multiband MIMO-based dual-mode portable
51 station of 3G W-CDMA and UWB communication receiver of
52 claim 9 wherein said eight A/D converters has the same
53 sampling frequency rate and resolution.

54 11. The multiband MIMO-based dual-mode portable
55 station of 3G W-CDMA and UWB communication receiver of
56 claim 9 wherein said two switches connects either two 3G W-
57 CDMA input signals or two UWB input signals.

58 12. The multiband MIMO-based dual-mode portable
59 station of 3G W-CDMA and UWB communication receiver of
60 claim 9 wherein said only two A/D converters operate in
61 parallel during the 3G W-CDMA receiver mode.

62 13. The multiband MIMO-based dual-mode portable
63 station of 3G W-CDMA and UWB communication receiver of

64 claim 9 wherein said eight A/D converters operate in
65 parallel during the UWB receiver mode.

66 14. The multiband MIMO-based dual-mode portable
67 station of 3G W-CDMA and UWB communication receiver of
68 claim 1 wherein said 3G W-CDMA baseband processor comprises
69 two digital filters, two down samplings, a MUX, and a
70 multiband rake receiver and decoder unit.

71 15. The multiband MIMO-based dual-mode portable
72 station of 3G W-CDMA and UWB communication receiver of
73 claim 14 wherein said multiband rake receiver and decoder
74 unit includes twelve complex modulations, twelve digital
75 filters, twelve despreaders and rake units, a MUX, a long
76 code user-p mask, a long code generator, a XOR, a
77 deinterleaver, a desymbol repetition, and a decoder.

78 16. The multiband MIMO-based dual-mode portable
79 station of 3G W-CDMA and UWB communication receiver of
80 claim 1 wherein said UWB OFDM multiband baseband processor
81 includes a combination section of a digital receiver filter
82 unit, a multiband dispreading unit, and a TEQ unit, four
83 S/P, four guard removing, four combination of FFT and FEQ,
84 five P/S, and a despreading, deinterleaver and decoding
85 unit.

86 17. The multiband MIMO-based dual-mode portable
87 station of 3G W-CDMA and UWB communication receiver of
88 claim 16 wherein said combination section of a digital
89 receiver filter unit, a multiband dispreading unit, and a
90 TEQ unit contains eight digital receiver filters, eight-
91 XOR, four-multiband-despreading, four-MUX, and four-TEQ.

92 18. The multiband MIMO-based dual-mode portable
93 station of 3G W-CDMA and UWB communication receiver of
94 claim 16 wherein the each of four combination of FFT and
95 FEQ includes 1024-point FFT and 500 N-tap equalizers, 500
96 decision detector units, and an adaptive algorithm.

97 19. The multiband MIMO-based dual-mode portable
98 station of 3G W-CDMA and UWB communication receiver of
99 claim 1 wherein said 3G W-CDMA and UWB OFDM multiband
100 control processor may be a digital signal processor, or a
101 microcontroller, or a combination of both processors.

102 20. The multiband MIMO-based dual-mode portable
103 station of 3G W-CDMA and UWB communication receiver of
104 claim 1 wherein said multiple antenna unit includes two
105 independent and identification antennas.

106 21. A dual-mode communication receiver of 3G W-CDMA
107 and UWB communication portable station comprises two

108 antennas, a MIMO-based dual-mode 3G W-CDMA and UWB
109 filtering and multicarrier RF section, a 3G W-CDMA baseband
110 processor, an UWB OFDM multiband baseband processor, a 3G
111 W-CDMA and UWB OFDM multiband control processor, and a
112 sharing memory bank.

113 22. The dual-mode communication receiver of 3G W-CDMA
114 and UWB communication portable station of claim 21 wherein
115 said UWB OFDM multiband baseband processor deals with four
116 OFDM multi-frequency bands, with each of 512 MHz.

117 23. The dual-mode communication receiver of 3G W-CDMA
118 and UWB communication portable station of claim 21 wherein
119 said 3G W-CDMA and UWB OFDM multiband control processor
120 controls data flow exchanging in the receiver.

121 24. A system, comprising:
122 a multiband MIMO-based 3G W-CDMA and UWB
123 communications including:
124 P-user 3G and UWB portable stations;
125 a MIMO-based 3G W-CDMA base station coupled to 3G
126 W-CDMA network interface section;
127 a MIMO-based UWB base station coupled to UWB
128 network interface section; and
129 a MIMO channel.

130 25. The system of claim 24, wherein the 3G and UWB
131 portable station comprises a multiband MIMO-based dual-mode
132 transceiver of 3G W-CDMA and UWB communication.